EPA National Priorities List (NPL) Site

Former Williams Air Force Base

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The former Williams Air Force Base (WAFB) is located in Mesa, Arizona. It is approximately 4,127 acres in size and the National Priorities List (NPL) site study area (site) includes the entire WAFB footprint.

WAFB began as a flight training school to prepare pilots for World War II. The base was operated continuously as an Air Force (AF) training school until 1993 when its military mission was discontinued under the Base Realignment and Closure (BRAC) program in the effort to realign the military's asset inventory and reduce expenditures of operation. The base was conveyed and converted into the civilian Williams Gateway Airport (later renamed Phoenix-Mesa Gateway Airport).

The AF transferred 96 percent of the former base to public and private ownership in 2005. The largest landowners of the former WAFB property are Phoenix-Mesa Gateway Airport, Gila River Indian Community, Arizona State University (ASU) East, and Maricopa Community College. The Department of Defense (DoD) has retained 10.74 acres for the U.S. Army Reserves and eight acres for continued military use by the AF.

Williams Air Force Base 1997

The nominal site boundary is Power Road to the west, Ray Road to the north, Pecos Road to the south, and Ellsworth Road to the east. Impacted areas vary, but are mostly contained within the site. A portion of one groundwater plume extends beyond the base boundary, but is still included as part of the NPL site study area.

Site Status Update:

Similar to many large scale clean up actions, the WAFB study area clean up was divided into Operable Units (OUs), with the OUs further divided into location specific sub-sites. Active sub-sites include:

- Landfill No. 4 (LF004) and Parcel N (XU403a), a portion of Operable Unit 1
- Liquid Fuel Storage Facility (ST012), a portion of Operable Unit 2
- Fire training area number 2 (FT02), a portion of Operable Unit 3
- South Desert Village (SDV), a portion of Operable Unit 4
- Site-wide and miscellaneous areas (many small sites are included within Operable Unit 4)
- Old pesticide/paint shop (SS17), a portion of Operable Unit 6
- Site ST035 (also known as Building 760), administered by Arizona Department of Environmental Quality (ADEQ)

The following provides a brief update on significant 2014 site activities and documents received by ADEQ.

Landfill No. 4 (site LF004), a portion of Operable Unit 1:

WAFB's main landfill was designated LF004. Volatile organic compounds (VOC's) have been detected in groundwater below and away from the LF004 boundary. The impacted groundwater extends south of the base boundary. A site remedy consisting of soil vapor extraction, in-well air stripping (IWAS) and chemical oxidation was initiated in 2014.

During this past activity period for site LF004, the following were performed:

- **Landfill soil vapor extraction system installation and initiation**
- **Landfill cover inspections and maintenance**
- **Landfill cover drainage pattern maintenance and cover erosion control maintenance**
- **Annual and period specific groundwater monitoring reports**
- **Final Annual 2013 Groundwater Monitoring Report**
- **Final Remedial Design and Remedial Action Work Plan for Operable Unit 1 Groundwater and Soil Gas Remedies, Site LF004**
- **Final Annual Landfill Cap Inspection and Maintenance Report, September and November 2013 Events, Site LF004**
- **Final Pre-Design Oxidant Test Work Plan (Addendum 1 to the Final Pre-Design Investigation Work Plan, Site LF004)**
- **Final Record of Decision Amendment, Operable Unit 1**
- **Final Technical Memorandum on LF004 Groundwater Monitoring Program Optimization, Site LF004**
- **Final Groundwater Monitoring Report, May 2013 Event**
- **Amended Proposed Plan for Operable Unit 1, Landfill 004**
- **An off-site well inspection and sampling report**
- **Select well modification notifications**

Landfill No. 4, Parcel N Debris Area (XU403a):

Included within site LF004 is the Parcel N Debris Area (recently designated site XU403a). This area was apparently used as an auxiliary disposal site. 2014 investigation and excavation revealed discarded military munitions and a few empty chemical weapon training sample containers. The Parcel N Debris Area was investigated by the Army Corps of Engineers under the Military Munitions Response Program (MMRP). The final report is pending, but progress reports indicate the US Army Corps of Engineers and subcontractors cleared the XU403a area of unexploded ordnance (UXO), discarded military munitions (DMM), and munitions constituents (MC). The landfill area is secured and segregated by chain link fencing.

Liquid Fuel Storage Facility (ST012), a portion of Operable Unit 2:

Liquid Fuel Storage Facility (ST012) is the former fuel storage depot. Jet petroleum grade 4 (JP-4, jet fuel) and aviation gas (AVGAS) were released. The actual release quantity is unknown, and could exceed 2.2 million gallons (2008 estimate, USAF Administrative Record No. 1519).

Soil remediation includes a soil vapor extraction (SVE) system. Impacted groundwater is being contained using a pump and treat system. During 2014 the AF installed and initiated a steam enhanced extraction system. The heat delivered through steam injection is anticipated to mobilize petroleum within the soil and groundwater. Extraction points will be used to collect volatile components and mobilized free product.

During this past activity period for site ST012, the following were submitted to ADEQ:

- **Final Remedial Design and Remedial Action Work Plan for Operable Unit 2 Revised Groundwater Remedy**
- **Final Soil Vapor Extraction System Operation and Maintenance Report, July through September 2013**
- **Final Soil Vapor Extraction System Operation and Maintenance Report, April through June 2013**
- **Final Soil Vapor Extraction System Operation and Maintenance Report, January through March 2013**
- **Final Containment System Status and Shutdown Report, July through October 2013**
- **Final Containment System Status Report, April through June 2013**
- **Final 2012 Annual Containment System Status Report,**
- **Final Containment System Status Report, January through March 2013**
- **Declaration of Environmental Use Restriction (DEUR) for Site ST012 for 2013**
- **Final Annual 2012 Groundwater Monitoring Report**
- **Final Soil Extraction System Operation and Maintenance 2012 Annual Performance Report**
- **Final Soil Vapor Extraction System Operations and Maintenance, July through September 2012**
- **Final Record of Decision Amendment 2, Groundwater, Operable Unit 2**
- **Select well modification notifications**

Fire Training Area Number 2 (FT02), a portion of Operable Unit 3:

Fire protection training exercises occurred between 1958 and 1991 on approximately 8.5 acres near the southern boundary of the base. The principal threat at the site is the potential migration of soil contaminants to groundwater. Flammable material and extinguishing agents were released to the underlying soil. After base closure, FT02 remedial action was performed to reduce benzene, chloroform, and 1,4-dichlorobenzene residual concentrations to cleanup levels. Perfluorinated compounds (PFC's) were also detected, and while not actively being remediated, the USAF is studying PFC's potential risks to human health and the environment as part of an unregulated chemical study program.

In 2014, soil vapor extraction was re-initiated to capture residual vapor which had accumulated during the preceding year's post-extraction vapor rebound observation period.

The AF is prioritizing its internal program to systematically sample PFC's. WAFB is on the list of air force facilities with fire training centers, but was not scheduled to receive funding this past activity period.

South Desert Village (SDV), a portion of Operable Unit 4:

A portion of the SDV was constructed over a former skeet-shooting range. Six inches of contaminated soil were removed and replaced with clean soil throughout the impacted area's residential yards, landscaped areas and open space. The residential area's land use restrictions include maintaining the protective cap. Arizona State University released Semi-annual Protective Cap Inspection Reports during the activity update period.

- **Semi-annual Protective Cap Inspection Report conducted July 15, 2014**
- **Semi-annual Protective Cap Inspection Report conducted January 21, 2014**
- **Semi-annual Protective Cap Inspection Report conducted August 9, 2013**

Site-wide and Miscellaneous areas (many small sites are included within Operable Unit 4):

Some activities occurred at miscellaneous areas not included within specific Operable Units or were Base-wide studies. During this past activity period, the following were submitted to ADEQ:

- **A site wide groundwater monitoring report for August 2013**

Operable Unit 6 and the old pesticide/paint shop (SS17), a portion of Operable Unit 6:

Operable Unit 6 (OU-6) includes a location designated Old Pesticide/Paint Shop (SS017). Dieldrin (an insecticide) and VOC-contaminated soil were excavated from a portion of the SS017 area, with the resulting excavation backfilled with clean soil, following verification of clean up goals. An adjoining parcel contains an elevated water tower landmark. Lead metal, possibly associated with paint coatings flaked from the onsite water storage tanks and ancillary buildings, has been reported in some non-excavated surface soil locations. Crushed rock and secured perimeter fencing minimize the public's exposure to the surface soil. The AF and regulatory agencies are discussing contaminant concerns, exposure potential, and future land use restrictions.

During this past activity period for SS17, the following were submitted to ADEQ:

- **Final Groundwater Monitoring Report, 2013 Annual Event**
- **Final Groundwater Monitoring Report, 2012 Annual Event**
- **A final supplemental risk assessment relating to the Old Pesticide/Paint Shop soil removal action.**

Site ST035 (also known as Building 760), administered by ADEQ:

Site ST035 is the former site of the base personnel's automobile gas station. The station was in operation from the mid-1960s until 1986. The site now forms part of Arizona State University (ASU) Polytechnic campus. The release was discovered during the 1993 tanks, dispensers and piping removal. Soil and groundwater at the site is contaminated with benzene, ethylene di-bromide (EDB),

methyl- tertiary butyl ether (MTBE) and dichloroethane (1,2-DCA). AF has installed numerous groundwater monitoring wells, soil vapor extraction system (SVE) wells, and soil vapor monitoring points at the site. A soil vapor extraction system operated at the site. The AF is reviewing site closure options in accordance with ADEQ's Leaking Underground Storage Tank guidance documents.

During this past activity period for site ST035, the following were submitted to ADEQ:

- Annual and period specific groundwater monitoring reports.
- Annual and period specific soil vapor extraction system operation and result reports.
- Final Groundwater Monitoring Report August 2013 Event
- Final Annual 2013 Groundwater Monitoring Report
- Final Groundwater Monitoring Report August 2013 Event
- Final Groundwater Monitoring Report, May 2013 Event
- Final Groundwater Monitoring Report, February 2013 Event
- Final Annual 2012 Groundwater Monitoring Report
- Field Variance Memorandum regarding Monitoring Well Installation
- Final Soil Vapor Extraction System Operation and Maintenance Report, July through September 2013
- Final Soil Vapor Extraction System Operation and Maintenance Report, April through June 2013
- Final Soil Vapor Extraction System Operation and Maintenance January through March 2013
- Final Soil Vapor Extraction System Operation and Maintenance 2012 Annual Performance Report
- Final Soil Vapor Extraction System Operation and Maintenance, July through September 2012
- Final Soil Vapor Extraction System Operation and Maintenance, April through June 2012

Community Involvement Activities:

A restoration advisory board (RAB) meets on a quarterly basis. The RAB meetings are open to the public. Public meetings are held as necessary, where the base closure team (BCT) presents proposed plans (remedies) and major milestones for the various sites. Public meetings are announced in local newspapers and may be held in conjunction with RAB meetings. In 2014 progress announcements included ST012 (OU-2), LF004 (OU-1), and Parcel N Debris Area (OU-1).

Site History:

1941 - 1948: The base was constructed in 1941 and served as a training facility, primarily pilot training. At the time the base was constructed, the site was surrounded by irrigated farmland and desert. Industrial activities at WAFB included heavy maintenance of aircraft and ground equipment in support of pilot training.

The former WAFB played a strategic role in America's aviation history. Over a span of 52 years, more than 26,500 men and women earned their wings at Williams. Gearing up for the combat pilot demands of World War II, the Army Air Corps broke ground in southeast Mesa for its Advanced Flying School on July 16, 1941. In February 1942, the growing military base's name was changed to Williams Field to honor Charles Linton Williams, an Arizona-born pilot. The facility was re-designated as WAFB in January 1948. WAFB was the U.S. Army Corp's foremost pilot training facility, graduating more student pilots and instructors than any other base in the country and supplying 25 percent of the AFs pilots annually. Contaminants from base activities included organic solvents and paint strippers, petroleum spills and leaks, metal plating wastes, hydraulic fluids, pesticides, and radiological wastes. Discharges and disposals at WAFB have resulted in soil and groundwater contamination.

1983: Site investigations initiated in 1983 under the auspices of the DoD installation restoration program identified thirteen potentially contaminated areas including: two fire training areas, a fuel storage area, two surface storm drainage areas, a hazardous material storage area, a landfill, a pesticide burial pit, a radiological disposal area, and four underground storage tanks.

1989: WAFB was placed on the NPL on November 21st. RIs initiated under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) discovered several new areas of contamination that were added to the existing list of sites.

1991 - 1993: WAFB was closed in 1993. After the announcement of closure in 1991, the community immediately began work to redevelop the base. Upon closing, WAFB was transferred to the Air Force Base Conversion Agency (AFBCA). AFBCA assumed responsibilities for the restoration and reuse of the base and worked with the RAB and Williams Redevelopment Partnership to maximize reuse of the land.

For cleanup purposes, the former base was divided into six operable units, OU-1 through OU-6. Each OU consists of many sites of potential concern; the following lists only the sites of primary interest for each OU:

- OU-1 contains the main base landfill (LF004) for which a ROD was signed in 1994. The remedy specified a permeable cap (soil) and monitor wells. At the time of the ROD, only low levels of contaminants were present in the wells. In 1997, higher levels of contamination were discovered in the landfill monitor wells and a follow-on RI was conducted in 2000. Concentrations of contaminants in some of the monitor wells installed during the follow-on RI are the highest ever seen at the site and indicate that contamination is migrating off of the former base.
- OU-2 addresses the groundwater and soil contamination at the ST-12. The results of the RI at ST-12 have confirmed that the primary contaminant is JP-4, jet fuel and aviation gas (AVGAS). There is a groundwater plume at ST-12 which resulted from the leakage of an unknown quantity of JP-4 and AVGAS. It is estimated that the groundwater contains 640,000 to 1.4 million gallons of JP-4 and AVGAS. The EPA believes as much as 12 million gallons may be in the soil and groundwater. Rising groundwater in the area, 40 feet over the last ten years, has covered the fuel and smeared it across many feet of deep soil making access to the plume (for remediation) increasingly difficult. The ROD for OU-2 was signed in December 1992. The AF has yet to implement a groundwater remedy at the site.
- OU-3 formerly addressed the vadose zone beginning 25 feet below land surface down to the water table at ST012 which is now a part of OU-2. The primary site of concern at OU-3 now is the FT-02. The 25,000 cubic yards of contaminated deep soils at the site were treated in place by enhancing natural bacterial breakdown of contaminants with bioventing. The ROD for OU-3 was signed in late June 1996. The standards agreed to in the ROD have not been achieved. However, the AF, in accordance with new state rules has conducted a risk assessment which determined that the cleanup levels attained do not pose a risk to human health or environment.
- OU-4 includes SDV which is currently serving as student housing for ASU East. Beneath SDV is a former six-station skeet range which was demolished and graded in 1950, prior to construction of the SDV. Contamination in the form of lead pellets in soil associated with the former skeet range underlies 85 housing units in the SDV. Since complete removal of contaminated soils would have required demolition of this valuable housing, a compromise solution involved removal of the top six inches of contaminated soil and installation of six inches of clean soil. The replacement soil is considered a protective cap over the remaining contamination, and will be subject to repair and maintenance, as well as land use restrictions in the form of a voluntary environmental mitigation and use restriction (VEMUR). The VEMUR defines the affected area as non-residential, and places deed restrictions to bind occupants to maintain the protective cap.

- OU-5 was set up to address nine soil sites which were closed out through expedited removal fill actions. No groundwater contamination is known to exist at any of the OU-5 sites. The OU-5 ROD was signed in February 1998.
- OU-6 was established to address three sites requiring additional investigation. The site of primary concern (site SS-17 Old Pesticide/Paint Shop) at OU-6 revealed soil contamination (dieldrin and VOC's). A removal action of dieldrin contaminated soil was completed and backfilled with clean soil following verification of clean up goals. The dieldrin contaminated soil was transported to a temporary treatment facility constructed near the former base landfill to undergo bioremediation.

1998 - 2004: OU-3 primary concern was the FT-02. Bioventing utilized at the site did not attain residential cleanup levels. The AF disagreed with the regulatory agencies' (ADEQ and EPA) determination that a Declaration of Environmental Use Restrictions (DEUR) was required for the site. Changes (November 2004) in the AFs policy regarding acceptable risk and reliance on a 1998 AF "receptor evaluation" (risk assessment) led to an Air Force's decision that the Site was suitable for unrestricted use.

2004 - 2005: OU-2 addressed groundwater and soil contamination at site ST-12. The AF and subcontractors completed design of the groundwater and vadose zone remedies. The vadose zone remedy consisted of a full-scale SVE system. The SVE system began operation in April 2005. The groundwater remedy consisted of a process called Thermal Enhanced Extraction (TEE). As of December 2004 the construction was 90% complete. However, the AF decided to withdraw the funding for completion of construction and operation of the TEE system. The AF notified the regulators of the funding withdrawal in February 2005. At that time the AF had already spent approximately $3,000,000 in the design and construction of the TEE system. EPA and ADEQ issued a formal letter of dispute regarding AFs failure to implement the remedial action at site ST-12.

2006: OU-1 contains LF-04. Over the past two years numerous monitor wells had shown a marked increase in TCE and PCE. Contaminants appeared to be moving off-site.

2007: The first phase (soil vapor investigation) of the RI to find the source and extent of VOC's in the groundwater at LF004 was begun. Additionally, three off-site borings were drilled and groundwater samples collected to determine where off-site groundwater monitor wells may be needed.

In November, the dieldrin-contaminated soil from the Old Pesticide/Paint Shop (SS-17) was removed northeast of the LF004 following an unsuccessful attempt at bioremediation. A total of approximately 6,000 cubic yards of contaminated soil and amendments were removed from the site and disposed of under an approved work plan. Following removal of the contaminated soil and amendments, confirmation sampling of the underlying soil indicated five "hot spots" where additional soil removal is required.

SVE continued to remove JP-4 from the vadose zone at ST012. Construction continued on the TEE pilot project, which was designed to remove the fuel from the groundwater.

The building 760 site, the site of gasoline releases from the former base service station, was being redeveloped by ASU East. Five groundwater monitor wells were abandoned to make way for building construction. The AF proposed replacement of the monitor wells, as well as installation of SVE wells and construction of a soil vapor treatment system. [Note: ADEQ's Underground Storage Tank Program (UST) assumed oversight of this project.] DEURs were completed for site SS021, Facility 1013 (a leaking underground storage tank site).

2008: The schedule for the RI to find the source and extent of VOCs in the groundwater at LF004 was extended. The AF completed the soil vapor investigation fieldwork. TCE found in soil gas samples and increasing concentrations of TCE in one groundwater monitor well caused the AF to expand the investigation in the area northeast of the landfill and delay submittal of the RI report. Additional borings to sample deep soil and groundwater were planned. A peer review committee was assembled by the AF to review the work to date and plans for additional investigation of the site, and to advise the AF and its contractor regarding data gaps, locations for additional groundwater monitor wells, and potential remedial technologies. Four new monitor wells were installed at the site.

SVE to remove JP-4 from the vadose zone continued at the ST012. The TEE pilot project, designed to remove the fuel and fuel components from the groundwater, began operation. Steam injection into the lower saturated zone (the deeper of two water bearing units that are to undergo treatment) began on October 28th, (with steam injection into the upper water bearing zone scheduled to occur approximately two weeks later). The project is scheduled to last approximately one year. Six new groundwater monitor wells were installed at the site.

The DEURs were completed for sites FT002, ST012, and SS020 to facilitate dispersal of the property to the Gateway Airport.

2009: Base-wide activities included publishing an update to the Base-wide sampling and Analysis Plan and a Base-wide Waste Management Plan, and recording a DEUR on site SS016 (Bldg 1085) to complete the ROD requirements. The transfer of SS016 to the Phoenix-Mesa Gateway Airport was completed.

The AF performed the following activities:

- conducted and reported semi-annual groundwater monitoring in accordance with the ROD
- conducted significant landfill maintenance
- conducted a final field effort to supplement the RI in which one area was found where there was a surface soil to groundwater contamination connection
- installed 31 new groundwater monitoring wells at Site LF004
- produced a site LF004 Groundwater Monitoring Work Plan
- conducted a bench scale ozone sparging test
- conducted operations at site ST012 performing Steps 2 through 5 of the TEE Work Plan
- collected post TEE application samples following test operations
- conducted and reported four quarters of groundwater monitoring
- produced a site ST012 Groundwater Monitoring Work Plan
- conducted and reported annual groundwater monitoring at site SS017
- produced a site SS017 groundwater monitoring work plan
- finalized a work plan to conduct step-out excavations at the TTF and awarded a contract to conduct the step-out excavations
- published the Parcel N Debris Area preliminary assessment/site inspection (PA/SI) work plan and initiated work on it
- completed installation of a fence around Parcel N
- published a final Interim Parcel N PA report
- awarded a contract to complete the Parcel N Debris Area PA/SI
- conducted and reported four quarters of groundwater monitoring at site ST035
- produced a site ST035 groundwater monitoring work plan
- installed five new groundwater monitoring wells
- completed installation of a SVE system

2010:


Discarded Military Munitions

Efforts at the former WAFB progressed on many fronts:

- The completion of a Supplemental RI report for LF004 that included a draft FFS.
- Parcel N underwent an investigation searching for MC as well as sampling and testing at selected locations for CERCLA contaminants. A more detailed investigation is planed for a section of Parcel N that has been identified as one of great concern and is scheduled for 2011;
- A report evaluating the pilot test of the TEE system at ST012 was submitted for review. The SVE system continues to remove contaminates from soils below the former fuel storage area;
- A pilot SVE system was constructed at the site of the former automobile gas station. The system was designed and constructed to blend into the surrounding ASU campus and its operation to be non obtrusive;
- The AF completed a program to replace groundwater monitoring wells that have become submerged by rising groundwater. Additional wells to monitor the different groundwater formations at the site were also sited in the various hydrographic layers at the site. New wells were also installed to delineate groundwater contamination on the project site;
- Groundwater monitoring at the site continues to be conducted to evaluate the remedial effort.

2011:

The AF performed the following activities:

- The AF hired AMEC Corporation as their performance-based remediation (PBR) contractor.
- Performed routine groundwater monitoring, inspections, and operation and maintenance of remedial systems.
- Work plans, groundwater monitoring reports, operation and maintenance (performance) reports, and inspection reports were completed as required.
- Completed installation of groundwater monitoring wells at sites ST035 and LF004, and abandonment of wells at site FT002.
- Finalized the OU-6 removal action completion report.
- Finalized the site ST012 containment study work plan.
- Held a public meeting and completed the OU-6 amended proposed plan.

2012:

The AF performed the following activities:

- Performed routine groundwater monitoring, inspections, and operation and maintenance of remedial systems.
- Work Plans, groundwater monitoring reports, operation and maintenance (performance) reports, and inspection reports were completed as required.
- Five off-base groundwater monitoring wells were installed south of the landfill site (LF004) to monitor for possible off-site migration of contamination.
- A Five Year Review (FYR) was completed.
- Began operation of the site ST012 groundwater containment system, an interim remedial action designed to operate until the full scale steam enhanced extraction system is designed and constructed.
- Completed a new base-wide quality assurance project plan and standard operating procedures.
- Performed and reported on the final site inspection and munitions and explosives of concern clearance (Phase 3) munitions response at the site XU403a.
- Completed a Finding of Suitability to Transfer (FOST) for the Air Force Research Laboratory (AFRL), Mesa Research Site.
- Completed the final in-well air stripping and monitoring well installation work plan for site ST035 and installed one remediation well and two groundwater monitoring wells.

2013:

The AF completed several items during this period:

SDV

- Two semi-annual Protective Cap Inspection Reports were released (dated Sept. 19, 2012 and Jan. 3, 2013).

Facility 1013 -

- One annual Facility 1013 DEUR report was submitted.

FT02

- One annual Site FT02 DEUR report was submitted.
- The AF initiated a program to systematically sample its active and closed bases for perfluorinated compounds (PFC's) at fire training areas as the unregulated chemicals gained increasing regulatory attention for their potential risks to human health and the environment.

LF004

- A draft ROD Amendment for Operable Unit 1.
- Well installation as part of Pre-Design Investigation field activities.
- Annual and period specific groundwater monitoring reports.
- A Technical Memorandum for the April 2013 Cap Maintenance.
- An Annual Landfill Inspection Report dated October 10 2012.
- An Amended Proposed Plan for Operable Unit 1, Landfill 004.
- A Focused FS for Site LF004.
- An LF004 Off-site Well Inspection and Sampling Report.

OU6

- A Revised OU-6 Removal Action Completion Report (RACR).

SS017

- A Groundwater Monitoring report for the 2012 Annual Event.
- A draft Supplemental Risk Assessment for soil removal action.

ST012

- **A Focused FS for OU-2 remedial alternatives.**
- **A draft Remedial Design and Remedial Action Work Plan.**
- **A ROD Amendment 2 for OU-2 groundwater.**
- **Documents discussing select groundwater well installations/modifications.**
- **A report detailing amendments added to the ST012 groundwater treatment system.**
- **Annual and period specific groundwater monitoring reports.**
- **Annual and period specific groundwater containment system reports.**
- **Annual and period specific soil vapor extraction system operation and result reports.**
- **A memorandum documenting research on potential contamination encountered during previous construction work in Avoca Street near Site ST012.**

ST035

- **One groundwater monitoring well (MW-21) installation notification**
- **Select well modification notifications**
- **Annual and period specific groundwater monitoring reports.**
- **Annual and period specific soil vapor extraction system operation and result reports**

Site wide and Miscellaneous areas:

- **A site characterization and corrective action completion report was submitted for underground storage tank closure actions completed at the Base's navigation beacon facility.**
- **A site wide groundwater monitoring report for August 2012.**

2014:

The AF completed several items during this period:

LF004:

- **Initiated a site remedy consisting of soil vapor extraction, in-well air stripping (IWAS) and chemical oxidation**
- **Landfill cover inspections and maintenance**
- **Landfill cover drainage pattern maintenance and cover erosion control maintenance**
- **Annual and period specific groundwater monitoring reports**
- **Final Annual 2013 Groundwater Monitoring Report**
- **Final Remedial Design and Remedial Action Work Plan for Operable Unit 1 Groundwater and Soil Gas Remedies, Site LF004**
- **Final Annual Landfill Cap Inspection and Maintenance Report, September and November 2013 Events, Site LF004**
- **Final Pre-Design Oxidant Test Work Plan (Addendum 1 to the Final Pre-Design Investigation Work Plan, Site LF004)**
- **Final Record of Decision Amendment, Operable Unit 1**
- **Final Technical Memorandum on LF004 Groundwater Monitoring Program Optimization, Site LF004**
- **Final Groundwater Monitoring Report, May 2013 Event**
- **Amended Proposed Plan for Operable Unit 1, Landfill 004**
- **An off-site well inspection and sampling report**
- **Select well modification notifications**

Parcel N Debris Area (XU403a):

- **Excavation, investigation and removal of unexploded ordnance (UXO), discarded military munitions (DMM), munitions constituents (MC) and empty chemical weapons (mustard gas oil) training sample vials**

(ST012):

- **Installed and initiated a steam enhanced extraction system**
- **Final Remedial Design and Remedial Action Work Plan for Operable Unit 2 Revised Groundwater Remedy**
- **Final Soil Vapor Extraction System Operation and Maintenance Report, July through September 2013**
- **Final Soil Vapor Extraction System Operation and Maintenance Report, April through June 2013**
- **Final Soil Vapor Extraction System Operation and Maintenance Report, January through March 2013**
- **Final Containment System Status and Shutdown Report, July through October 2013**
- **Final Containment System Status Report, April through June 2013**
- **Final 2012 Annual Containment System Status Report,**
- **Final Containment System Status Report, January through March 2013**
- **Declaration of Environmental Use Restriction (DEUR) for Site ST012 for 2013**
- **Final Annual 2012 Groundwater Monitoring Report**
- **Final Soil Extraction System Operation and Maintenance 2012 Annual Performance Report**
- **Final Soil Vapor Extraction System Operations and Maintenance, July through September 2012**
- **Final Record of Decision Amendment 2, Groundwater, Operable Unit 2**
- **Select well modification notifications**

FT02:

- **Installed and re-initiated a soil vapor extraction system**

SDV:

- **Released Semi-annual Protective Cap Inspection Report conducted July 15, 2014**
- **Released Semi-annual Protective Cap Inspection Report conducted January 21, 2014**
- **Released Semi-annual Protective Cap Inspection Report conducted August 9, 2013**

Site-wide and Miscellaneous areas:

- **A site wide groundwater monitoring report for August 2013**

OU-6 and SS17:

- **Final Groundwater Monitoring Report, 2013 Annual Event**
- **Final Groundwater Monitoring Report, 2012 Annual Event**

- A final supplemental risk assessment relating to the Old Pesticide/Paint Shop soil removal action.

ST035:

- Annual and period specific groundwater monitoring reports.
- Annual and period specific soil vapor extraction system operation and result reports.
- Final Groundwater Monitoring Report August 2013 Event
- Final Annual 2013 Groundwater Monitoring Report
- Final Groundwater Monitoring Report August 2013 Event
- Final Groundwater Monitoring Report, May 2013 Event
- Final Groundwater Monitoring Report, February 2013 Event
- Final Annual 2012 Groundwater Monitoring Report
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- Final Soil Vapor Extraction System Operation and Maintenance, July through September 2012
- Final Soil Vapor Extraction System Operation and Maintenance, April through June 2012

Contaminants:

Discharges and disposal at WAFB resulted in soil and groundwater contamination. Contaminants of concern include organic solvents and paint strippers, pesticides, petroleum hydrocarbons, automotive fuel and additives, jet fuel, aviation gas and semi-volatile organic compounds (polycyclic aromatic hydrocarbons). Contaminants of concern at the site may change as new data become available. Other contaminant materials investigated include perfluorinated compounds (PFC's), select heavy metals, metal plating wastes, radiological wastes, unexploded ordnance and chemical weapons material.

Public Health Impact:

No known human health exposure risk is present at this time. Exposure pathways have been eliminated through remediation or restricted access/use. No drinking water supply wells are known to be impacted.

Site Hydrogeology:

WAFB is located within the Salt River Valley in the basin and range province. The site is underlain by alluvial sediments comprising the upper, middle and lower aquifer units.

The two uppermost aquifers beneath the former base are separated by silty and/or clayey sediment. Aquifer interconnection has been identified on a localized, site-by-site basis. In the immediate vicinity of ST012, the two aquifers are separated by a competent aquitard. The two aquifers will be referred to as the upper aquifer and deep aquifer. Both aquifers consist of interbedded, fine- and coarse-grained strata.

The upper aquifer extends from the water table (currently between 140 and 180 feet below ground surface (bgs)) to approximately 245 feet bgs. The upper aquifer has excellent water-bearing characteristics, but has a reduced ability to supply water because of over-drafting. Much of the water found in the upper aquifer, some of which is perched on low permeability strata, is of poor quality due to its origin as infiltration of irrigation water. Localized studies at the former base show groundwater flows to the east-southeast in the upper aquifer.

Locally (at ST012, SS-17, and LF-04) groundwater in the upper aquifer flows to the east-southeast. The flow direction of the upper aquifer has not changed even though groundwater elevations have increased more than 50 feet since 1989. Similarly, the hydraulic gradient has remained relatively stable throughout activities at the site. An average value for the hydraulic gradient across the entire site is 0.0055.

The deep aquifer unit has historically been a major source of groundwater in the general vicinity of the former base. Although it is classified as a fine-grained unit, local sand and gravel units greatly increase its water-producing capability. Deep-screened monitor wells at the former base have shown a general northward trend for groundwater flow.

Water levels in the vicinity of the former base have been depressed as a result of nearby groundwater supply demands. Measurement records from base production wells show that water levels in the deep aquifer decreased approximately 30 feet between 1953 and 1961, and remained depressed until 1981 when water levels began to increase gradually. From 1989 through 1991, water levels increased 2.5 feet in the shallow wells, an average of 1.25 ft/yr. Since 1992, water levels have raised an average of 4.0 ft/yr.

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*In Arizona, but outside the Phoenix area, call toll-free at (800) 234-5677.
**Call EPA's toll-free message line at (800) 231-3075.

Information Repository:

Interested parties can review select site documents at the Arizona State University East Library, 7001 E. Williams Field Road, Bldg. 20; (480) 727-1157 (contact: Ellen Welty). The Air Force maintains the administrative record for the

site. Documents are available via the Air Force Real Property Agency (AFRPA) website.

Interested parties can review site information here on this page and at the ADEQ Record Center located at 1110 W. Washington Street, Phoenix, Arizona. Please contact (602) 771-4380 or (800) 234-5677 ext. 6027714380 for hours of operation and to schedule an appointment.

The complete official site file can be reviewed at the EPA Region IX, Records Center, Mail Stop SFD-7C, 95 Hawthorne Street, Room 403, San Francisco, CA 94105; (415) 536-2000.

Fact Sheet

Site Map

Amended Proposed Plan Summary Fact Sheet (September 2011)

U.S. EPA Site Description